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ENTOMOLOGICAL NEWS

Vol. XXIV. No. 8

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PHILADELPHIA:
The Academy of Natural Sciences,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 25 CENTS

Advertising Rates: Per inch, full width of page, single insertion, $1.00; a discount of ten per cent. on insertions of five months or over. No advertisement taken for less than $1.00—Cash in advance.

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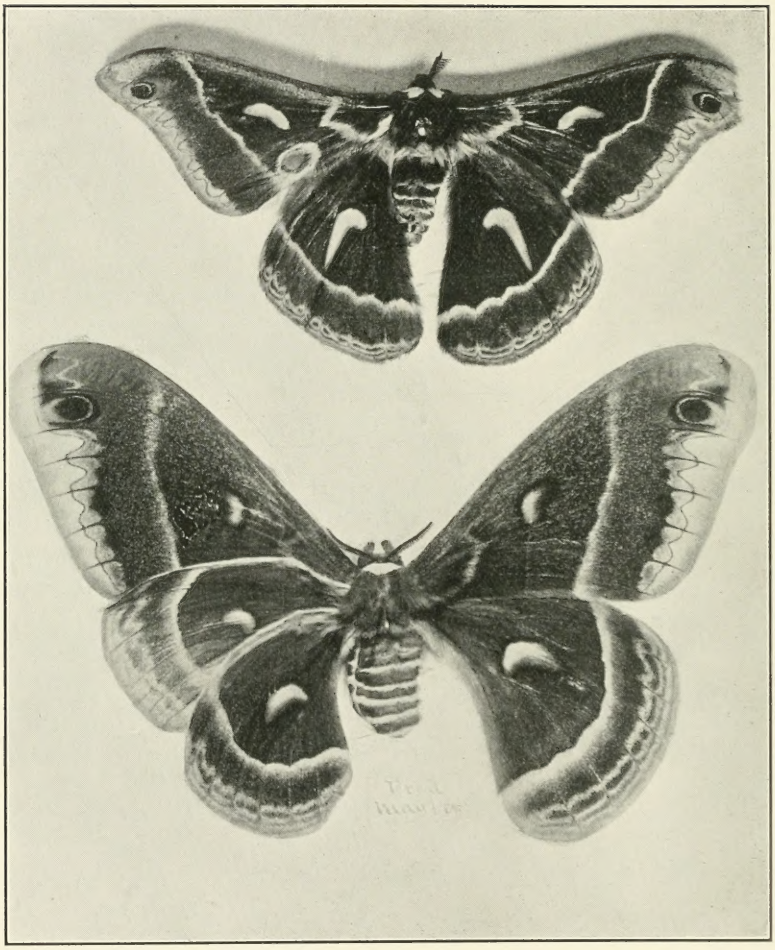

ABNORMAL WING FORMATIONS.—RAU AND HOSENFELT.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV. OCTOBER, 1913. No. 8.

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Abnormal Wing Formations in Samia cecropia and S. californica (Lep.).

By PHIL RAU and GEO. H. HOSENFELT, St. Louis, Mo.

(Plate XI)

A female *Samia cecropia,* having a fifth wing emerged from its cocoon on May 6, 1904. This cocoon was one of a lot of forty which were taken in the southwestern part of St. Louis.

The figure makes any further description superfluous excepting that the supernumerary wing is in no way connected with the normal one, and the attachment of the wing to the thorax is quite independent of the others. This wing is an exception to those usually recorded in that it is only slightly aborted. This female differs from the male of the same species recorded by Bateson in that this supernumerary wing is a complete repetition of the left secondary wing, markings and all, whereas the one Bateson* records

* Materials for the Study of Variation, p. 283.

(quoting Strecker) is a repetition of only the anterior part of the left primary wing.

It would be well to record abnormal wing formations since Bateson tells us, "In some cases the extra wing is a close copy of a normal structure; in others it seems to be more or less deformed. No genuine case of an extra wing present on both sides of the body is known to me."

The upper illustration showing the ocellar marking on the left fore-wing of *Samia californica* is of an insect which came from Sonoma County, California. This male emerged on May 30, 1912, and was normal in every respect excepting the "eye-spot" in the left primary. This spot is a hole in the insect's wing, the periphery of this hole being white, edged off with a small band of brown. It was at first thought that the insect had met with an accident, but since the color was displaced and the edges around the hole were not broken but smoothly finished off, we concluded it must have acquired this condition before leaving the cocoon. Bateson, who goes into details concerning the eye-spots in Lepidoptera, mentions no case in any of his citations showing a similar condition of wing formation.

Fragments on North American Insects—VI.

By A. A. Girault, Nelson (Cairns), North Queensland, Australia.

1. The Effects of the Partial Amputation of the Antennae (Lep.).

Several times in June, 1902 and 1903, I removed most of the antennae from one or two specimens of Bombycid, Agaristid and Arctiiad moths by snipping them off near base with scissors. The remaining stumps were usually not more than an eighth of an inch long. The effect seemed to be that the mutilated moths became quite helpless but active. The flight was irregular and all locomotion tended to be circular or one-sided; if one stump was longer it seemed to have more control, the movement being in relation to it and probably causing the circular flight. In one moth, the stumps were in constant movement and the insect appeared to be trying

to make the fore legs function as antennae and once the maxillae.

2. The Occurrence of Heliothis obsoleta (Fabricius) in North Queensland (Lep.).

Early in April, 1912 (April 10), I hastily examined a field of corn near Nelson (Cairns District), North Queensland, Australia, and found it badly infested with the cotton boll-worm of the Southern United States and elsewhere. The injury to the ears was characteristic and such larvae as were found could not be mistaken by one familiar with the young of the species. Several eggs were also found on the silk. The occurrence is worth recording, since the insect, I believe, has never been recorded from this region, though known years since to occur in the southern portions of the state. The caterpillars found were in stadia II and IV. Most of the corn was about half mature, referring to the ears, the plant long since grown. A week later, the insect was observed in another field of Indian corn growing among sugar cane, five miles nearer Cairns. It is well established in North Queensland, evidently, but I did not see it in a cotton field visited for a short while.

3. Fragments on Icthyura inclusa var. palla (Lep.).

Colonies of the caterpillars of this species at Blacksburg, Virginia, were obtained from willow, June 28, 1902. The nests containing a colony usually surrounded two slender twigs with their foliage. The colonies were combined and fed, all in one rearing-cage. On July 9, after several days of neglect, all of the caterpillars attempted to pupate, though most were certainly not fullgrown. The action was obviously an adaptive one. The cocoons were constructed between two leaves or else merely in the web of the nest. Very few of the larvae succeeded in changing themselves. On July 19, the moths commenced to appear and they were transferred to another cage in order to mate them. On July 21 a pair were observed mating, the female above, hanging from the top of the cage by her conspicuous fore legs, the male hanging head downward from the tip of the abdomen of the female, the

two held together by the claspers only; the act occupies an hour or more. The following day (July 22) eggs were found; at first these are pinkish, changing as the embryo reaches perfection to purple, or rarely, a bright orange or red; just before hatching, they are lavender in color. The mass noted above hatched early in the morning of August 5, or after about fourteen days plus. Ichneumonoid parasites of the larva were common.

Hatching in this species occurs by means of eating a rounded piece out of the top of the egg. One female deposited two masses of eggs totaling a hundred and thirteen. On July 14, 1902, a colony was taken from cottonwood or Carolina poplar.

4. The Occurrence of Acronycta hamamelis in Virginia (Lep.).

Larvae of the species were captured from oak, August 26 and September 2, 1902. A larva captured on the first date made a cocoon early in September.

5. The Number of Pteromalids From a Single Chrysalis (Hym.).

At Blacksburg, Virginia, May 21, 1902, two parasitized chrysalids of *Basilarchia archippus* Cramer were given to me by Professor William B. Alwood. The pteromalids emerged on May 28. From one chrysalid, there were obtained three hundred and seventy-five. The species was probably *Pteromalus graptae* Howard, though it is not sure.

6. Hidden Aphid Eggs (Hemip.).

Once when I was examining an eggmass of *Malacosoma americana,* the well-known black eggs of a species of Aphidae were found hidden in the spaces between the eggs of the bottom of the mass, or that part of the mass which was next to the twig. Subsequently numerous cases of this kind were observed. The tree was apple, Blacksburg, Virginia, February, 1903. Since the overwintering eggs of the aphids are not deposited until late in the autumn and the overwintering eggs of the moths, months previously, early in summer, it is a mystery how the aphid eggs were thus deposited.

7. Trypeta polita Loew (Dip.).

The small, roundish galls of this dipteron are found during the winter in Virginia on composites. The interior of the gall is pithy and may contain two larval cells, though I be-

lieve one is the usual number. A number of galls collected from *Solidago* in the winter of 1903 yielded the adult flies on May 13 and 15. A eurytomid also appeared. The fly was identified by Coquillett. The exit-hole is large and round.

8. Number of Chalcidoid Parasites from Arctiiad Pupae (Hym.). Three arctiiad pupae were found at Blacksburg, Virginia, June 25, 1902, under fence rails lying upon the ground. All were parasitized. From one, a hundred and fifteen parasites emerged, while from a second only forty-four. The other was lost. Neither host or parasite is known.

9. The Fowlbug, Cimex columbarius Jenyns (Hemip.). An adult of this relative of the common bedbug captured in a henhouse at Anacostia, District of Columbia, September 24, 1905, and placed within an ordinary physician's pillbox, retained its normal color until death occurred on March 31, 1906. It was not fed and lived in captivity a hundred and eighty-eight days without nourishment. It was recently fed when captured and of the female sex. Another female was captured at the same time, and similarly kept; it died about the middle of December following. Both were alone. The second female produced seven young, which hatched by October 11. A third adult died a few days after capture, though it had been fed once upon recently born mice (*Mus*). A *nymph* (fifth stage) captured with the others molted to adult on September 29 and died on October 7, 1905; it was not fed.

Three nymphs of the first stage were fed on human blood by giving them access to a lower portion of the fore-arm, November 15, 1906:

1. Began feeding	1:17½	p. m.
First blood entered	1:19	p. m.
First blood entered abdomen	1:25	p. m.
Ceased feeding, wholly colored	1:26	p. m.
Commenced again	1:27	p. m.
Ceased, about half gorged	1:30	p. m.
2. Began feeding	1:44	p. m.
First blood entered	1:44½	p. m.
First blood entered abdomen	1:44¾	p. m.
Ceased feeding, gorged	1:47	p. m.
3. Began feeding	1:37	p. m.
Ceased, gorged	1:39	p. m.

Upon comparing the first larval stages of *columbarius* and *lectularius* the following were found: the coloration is the same, the structure appears to be identical in both, the antennae are four-jointed, the distal two joints long and slender, the distal joint longest, the proximal joint very short, the second joint about half the length of the third, but stouter; tarsi two-jointed, the first joint very short. Thus, the adult differences do not hold for the young larvæ.

10. Coccinellids Probably Feeding upon Foliage (Col.).

On March 19, 1904, Mr. F. C. Bishopp showed me adult specimens of *Megilla maculata* and *Coccinella sanguinea* taken at Greenville, Texas, and which he thought had been feeding upon the foliage of a *Rumex*.

11. Occurrence of the Phorid Trineura aterrima Fabricius in Texas (Dip.).

At Paris, Texas, March 17, 1904, I captured a single specimen of this phorid while using the sweeping net in meadows. The species was identified by Brues.

12. The Effect of the Local Climatic Variations Upon the Daily Activities of Some Insect Groups (Col.).

Entomologists are very familiar with the fluctuating luck with which sugaring for moths is attended and those who have paid even casual attention to collecting beetles at lights, or to the jarring of trees at nights for scarabaeids, must have noticed the same thing. It is a matter commonly experienced, that, even in the height of the season's activity, some days or some nights are much better for purposes of observation, without any apparent reason for it, other than it is clear or cloudy or still or windy, or sultry or not, dark or the moon shines. Sometimes, even at what are taken to be ideal times, disappointment follows. The species of *Lachnosterna* seem to be especially susceptible to any slight climatic changes and on nights when they are expected in numbers, never appear. I had frequently noticed this when collecting these beetles from their foodplants, night after night. At lights, also, I have seen them very abundant when least expected, on rather cool evenings for instance. Since the activity of many nocturnal insects commences during twilight or at dusk, it has often

occurred to me that the conditions prevailing then shape the subsequent activities, at least in many cases. These one or two facts bearing on the general question were casually noted in regard to the contents of a lantern trap placed in a cotton field near Paris, Texas, in 1904: Three out of four evenings noted were warm, dark and still, (May 2, 11 and 15) and the beetles of the genus *Lachnosterna* were abundant, forming most of the trap contents; the fourth evening (May 14), the beetles were absent, only small species of Lepidoptera being caught in numbers. The day was clear and pleasant, but the evening cool. The lower evening temperature and greater light here are indicated. The maximum temperature this day was about seven degrees lower than that of the other three days, but the minimum was half a degree higher than that of May 15. The three days on which they were abundant were each warmer than the preceding day and the evenings dark. The patent fact shown is that the activity of these beetles was fluctuating, true also for the Lepidoptera, abundant some of the nights, at others scarce or absent altogether.

13. The Death Feigning Habit of Trox. (Col.).

Specimens of this genus which I captured under the skin of some animal lying upon the ground in a wood near Paris, Texas, March 6, 1904, at once assumed a death-feigning attitude as soon as disturbed. They remained perfectly still, the legs drawn in close to the body and rigid, the beetles upon their backs. Their extraordinarily hard bodies and curious form, combined with an association of brittleness which one obtains by looking at them, are heightened by the rigid attitude assumed in the first movement. They certainly do not appear especially nourishing at any time.

14. The Extraordinary Tenacity of Life in an Elaterid, as Compared with other Insects. (Col.).

A large elaterid of the genus *Alaus* was captured at Houston, Texas, from a concavity in a stump where it was hibernating, January 30, 1904. It was placed in a cyanide bottle and upon my return to Paris, pinned and labeled in the usual

way. Later, however, it was found to be still alive and had to be "rekilled" in the cyanide and repinned one or two times. On March 1st, it was found necessary to place it in the cyanide bottle a fourth time, but even after fifteen hours exposure, life was still evident (at this time the bottle readily killed a cerambycid and *Benacus*). By noon, March 2, it was apparently dead and was repinned and placed in the cabinet. For several days it exhibited no signs of life; but on March 7, it was livelier than ever. On March 8 it was exposed to the cyanide for thirty-one hours and died apparently, since no other note concerning it was made. This is an illustration of marked advantage in resistance of one species over many others when exposed to adverse (but unnatural) conditions.

The Butterflies of Omaha, Nebraska (Lepid.).

By R. A. Leussler, Omaha, Neb.

Omaha, Nebraska, is situated on the eastern margin of the State, on the bank of the Missouri River, in latitude 41 deg. 16 min. Being geographically near the center of the United States, this locality presents perhaps a rather varied butterfly fauna. The surface of the country bordering the river originally consisted of heavily wooded bluffs cut into by deep ravines at many places, with some low-lying, timber-covered bottom land between the bluffs and the river. The original surface has, of course, been greatly altered in the city itself, but in the suburbs to the north and south much of the wooded bluffs remain. This woodland strip extends westward from the river for a distance of perhaps three miles, where it shades off into rolling prairie. The bottom land has mostly been cleared and turned into meadow. The principal native trees are oak, ash, walnut, elm, ironwood, hackberry, basswood, redhaw, willow, boxelder and cottonwood, while some of the native shrubs to be found are hazelnut, gooseberry, currant, wild plum, choke cherry, prickly ash, sumac, burning bush, bittersweet, elderberry and wolfberry. Wild grape and poison ivy

also abound. The climate may be said to be one of extremes; the summers are usually hot and the winters often severe. An idea of the extremes can be gained when it is stated that in July, 1911, the Government weather bureau recorded a temperature of 107 degrees, and in January, 1912, 27 degrees below zero—a range of 134 degrees within 6 months. The average annual precipitation is about 31 inches, by far the greater part falling between April and August. High winds are common and many an otherwise perfect day is utterly spoiled for butterfly collecting by a stiff wind, causing butterflies to hide in shelter.

The writer has spent five years collecting in this locality, and as he does not find that anything has been written concerning the butterflies to be found here he gives the following list as embracing the species found on the Nebraska side of the river in the immediate vicinity of Omaha.

The classification used is that found in Dyar's List of N. A. Lepidoptera (Bull. 52, U. S. Nat. Museum), and reference was had to the following works in arriving at identifications: The Butterflies of North America.—W. H. Edwards. Butterflies of the Eastern U. S. and Can.—S. H. Scudder. The Butterfly Book.—W. J. Holland. Everyday Butterflies.—S. H. Scudder. The Butterflies of the West Coast.—W. G. Wright. The Butterflies of Montana.—M. J. Elrod. A Review of the Hesperiidae of the U. S.—H. G. Dyar. The Boreal Am. Species of Chlorippe.—Hy. Skinner. Entomological News, Canadian Entomologist, and original descriptions of species from various publications.

Access was also had to the collection of the University of Nebraska and to the private collection of Dr. Robt. H. Wolcott, of Lincoln, Neb., the latter also kindly assisting in making identifications.

1. *Iphiclides ajax*, var. *telamonides* Feld.—A single specimen, Apr. 3, 1910.

1-a. *Iphiclides ajax*, var. *marcellus* Bd.-Lec.—Rare; occasionally found during late June and July.

2. *Papilio daunus* Bd.—A single specimen taken by Dr. R. H. Wolcott May 1, 1910, while collecting with myself, and identification is positive.

3. *Papilio glaucus* Linn.—Black females can invariably be found during May and June; occasionally also during August.

3-a. *Papilio glaucus,* var. *turnus* Linn.—Common; first brood appears late in April, flies throughout May; second brood appears middle of July; flies throughout August.

4. *Papilio thoas* Linn.—Common; first brood, May and June; second brood, August.

5. *Papilio polyxenes* Fab.—Common; first brood, May and June; second brood, Aug. and September.

6. *Laertias philenor* Linn.—Not common, although both larvae and mature insects have been taken. First brood, July; second brood, October.

7. *Tachyris margarita* Hüb.—A single tattered specimen taken Aug. 25, 1909, following ten days of steady southeast wind. Clearly a straggler. Specimen is a male and has the stiff brush-like clusters of hairs attached to the abdominal clasps, leaving no doubt as to identification.

8. *Pontia protodice* Bd.-Lec.—Very common; on the wing from May to October.

8-a. *Pontia protodice* var. *vernalis* Edw.—Not common; found in May and sometimes in October.

9. *Pontia rapae* Linn.—Exceedingly common; found everywhere and at all times from March till October. A few specimens have been taken in early spring which approach var. *immaculata* but have one black spot on under side of primary.

10. *Nathalis iole* Bd.—Very plentiful, sometimes actually swarming; apparently two broods, first usually appearing early in July and second, early in September.

11. *Callidryas eubule* Linn.—Some years fairly abundant, other years rare; appears usually about Aug. 20 and flies till the end of September.

12. *Zerene caesonia* Stoll.—Fairly common in Aug. and Sept., and sometimes single individuals are found in May.

12-a. *Zerene caesonia,* var. *rosa* McNeill.—Some specimens of this variety found in Sept. and Oct.

13. *Eurymus eurytheme* Bd.—One of our commonest butterflies; typical form found principally from June till October, some albinos (♀) found mostly in September.

13-a *Eurymus eurytheme,* var. *ariadne* Edw.—3 specimens (2 ♂, 1 ♀) taken which appear to be this form; they closely resemble the figures in Holland's Butterfly Book, but do not have the orange patch as distinctly defined as the illustrations in Edwards' Butt. N. A.

13-b. *Eurymus eurytheme,* var. *eriphyle* Edw.—This form is not common here, but is found from August till October.

13-c. *Eurymus eurytheme,* var. *keewaydin* Edw.—This form is quite common. May & June.

14. *Eurymus philodice* Godt.—Common; several broods; May till October.

14-a. *Eurymus philodice,* var. *luteitincta* Wolcott.—Two specimens taken June, 1910, and identified by Dr. Robt. H. Wolcott, who originally described this variety from Batavia, Ill., and Grand Rapids, Mich.

15. *Pyrisita mexicana* Bd.—Present in fair numbers late in September and early in October.

16. *Eurema nicippe* Cram.—One specimen taken by Mr. F. H. Marshall, June 18, 1910—one ditto June 3, 1911. Both somewhat worn.

17. *Eurema euterpe* Men.—Common; apparently two broods, the first making its appearance about the middle of July, the second about the first of September.

17-a. *Eurema euterpe,* var. *alba* Streck.—Occasionally some females of this species are found which are very pale, almost white.

18. *Colaenis julia* Fab.—A single specimen (♂) taken Sept., 1908, while settled on *Zinnia,* in her garden in Omaha, by Mrs. W. B. Graham. Specimen is now in the writer's collection, is somewhat rubbed, but colors are fresh and it is not tattered as though it had traveled a long distance. It is more likely that it was introduced, as larva or chrysalis, with a shipment of tropical fruit.

19. *Agraulis vanillae* Linn.—A number of larvae (60 or 70) of this species found feeding on passion vine in his garden by Mr. F. H. Marshall and some of them reared to imagoes. This vine was grown from a slip taken from a parent vine which had been growing in the greenhouse of an Omaha florist for several years, making it certain that the eggs were deposited by a female flying here at Omaha.

20. *Euptoieta claudia* Cram.—Common; found on the wing in every month from May to October; fresh specimens are most numerous in July and September, indicating two broods.

21. *Speyeria idalia* Dru.—Quite abundant; appears usually about the middle of June and remains on the wing until the middle of September, although there is but one brood.

22. *Argynnis cybele* Fab.—Our common Argynnis; also single brooded, its season being about the same as the foregoing.

23. *Argynnis aphrodite* Fab.—Extremely rare, but one specimen having been taken here. That one was taken by Mr. F. H. Marshall, Aug. 26, 1912.

23-a. *Argynnis aphrodite,* var. *alcestis* Edw.—Very rare; one capture by Mr. F. H. Marshall, July 24, 1909, and one by the writer, July 20, 1912.

24. *Brenthis myrina* Cram.—Plentiful in some years and not found at all in others, though searched for in the same places. Apparently triple-brooded, as fresh specimens have been taken in May, July and September. All specimens taken here are considerably larger than figured in Holland's "Butterfly Book" and Scudder's "Everyday Butterflies." The figures cited show an expanse of 40 & 42 mm. respectively, while the Omaha specimens have an expanse of 54 to 56 mm. in the case of males and 60 mm. in the case of females.

25. *Charidryas nycteis* Doubl.-Hew.—Fairly common; two broods; one in June, the other in August.

26. *Charidryas ismeria* Bd.-Lec.—Rare at Omaha, although a short distance west it is found abundantly.

27. *Phyciodes vesta* Edw.—A single specimen (♀) taken July 14, 1912. Upper side is identical with fig. 18, Pl. XVII, Holland's "Butterfly Book," while both upper side and under side agree with figures of summer form shown in Edwards' "Butt. N. A."

28. *Phyciodes tharos* Dru.—Common in May, but not as plentiful as var. *morpheus* is later in the season.

28-a. *Phyciodes tharos,* var. *morpheus* Fab.—Very common; on the wing from July till October.

29. *Anthanassa texana* Edw.—But two specimens taken; one (♀) by Mr. F. H. Shoemaker, Mar. 27, 1910, one (♂) by the writer, Sept. 14, 1911; both are fresh specimens. Explaining the early date of the 1910 capture, it should be stated that abnormally warm weather prevailed during the latter half of March of that year, bringing butterflies out about three weeks earlier than usual.

30. *Polygonia interrogationis* Fab.—Common; flies from the middle of August till October, then hibernates.

30-a. *Polygonia interrogationis,* var. *umbrosa* Lint.—Common; flies from latter part of May till July.

31. *Polygonia comma* Harris—Common; appears early in Sept. and flies till freezing weather, when it hibernates and flies again early the following spring.

31-a. *Polygonia comma,* var. *dryas* Edw.—This form is found from the middle of June till the end of July, but is not nearly as numerous as the preceding.

32. *Euvanessa antiopa* Linn.—Common; two broods, first appearing the latter half of June; second, the middle of August, the latter hibernating.

33. *Vanessa atalanta* Linn.—Very common; several broods, the insect being on the wing from April or May till October.

34. *Vanessa huntera* Fab.—Some years fairly common and other years not found at all; flies from May till October.

35. *Vanessa cardui* Linn.—Common in most years, but scarce in others; several broods for it can be found from April till October.

36. *Junonia coenia* Hüb.—Can usually be found late in August and throughout September, but is also found in June and July, so there must be two broods.

37. *Basilarchia astyanax* Fab.—Common; found from the middle of June till the middle of September. Two broods, the second making its appearance about the middle of August.

38. *Basilarchia archippus* Cram.—Common; two broods; seasons nearly the same as the foregoing species.

39. *Chlorippe celtis* Bd-Lec.—Fairly common; two broods; first, in June; second, in August.

40. *Chlorippe clyton* Bd-Lec.—Not as common as *celtis*, but larvae in goodly numbers can be found on hackberry early in June, some of them nearly full grown and others still quite small. There is only one brood, but though the first butterflies emerge from chrysalids before the middle of June, others continue to emerge until past the first of August. The earliest emerging butterflies are *clyton-clyton* or *ocellata* of Edw. and as the season advances the later emerging ones become darker and darker, until those coming, say after the middle of July, are form *proserpina*. I have bred this species several seasons and have obtained all gradations from true *clyton* to true *proserpina*.

40-a. *Chlorippe clyton*, var. *proserpina* Scud.—As stated above, the later appearing *clyton* are of this form and there are pretty nearly as many of one form as of the other.

41. *Chlorippe flora* Edw.—One specimen emerging from chrysalis, June 12, 1911, agrees with figures of *flora* in Edwards' "Butt. N. A." and with Edwards' description of *flora*, also with specimens in the Strecker collection labeled *flora*. The larva of this one was collected along with a number of *clyton* larvae and I cannot recall that it was markedly different. It is possible that *flora* is only an extremely light form of *clyton*.

42. *Anaea andria* Scudd.—Neither very rare nor yet common; flies in October, hibernates and flies again in spring. More easily found in the spring than in autumn.

43. *Cercyonis alope*, var. *nephele* Kirby.—Common; the form found here is Edwards' *olympus;* single brooded; last half of July till past middle of August.

44. *Enodia portlandia* Fab.—Not very common; usually found the last half of June and the early part of July, but in some years appears to be double-brooded, for in 1910 fresh specimens were taken, June 14 and 18 and again on August 20 and Sept. 5. In 1912 fresh specimens were taken, June 22 and 26 and on September 19 a fairly fresh specimen (♀) was taken.

45. *Satyrodes canthus Linn.*—Very local, having been found in only one locality—a spring-fed marsh—so far. Appears early in July. What is true of *B. myrina*, as to size, is true of this species, the Omaha specimens are considerably larger than those illustrated by Holland and Scudder. The butterflies illustrated show an expanse of 48 to 50 mm. and I have specimens from Michigan which are no larger, while the Omaha specimens, both male and female, have an expanse of 60 mm. They are also quite dark.

46. *Cissia eurytus* Fab.—Common; single brooded; appears late in June, sometimes not till after the first of July. This is a full month later than its appearance in New England according to Scudder.

47. *Anosia plexippus* Linn.—Very common; can be found any time from May till freezing weather.

48. *Hypatus bachmanni* Kirtl.—Found occasionally, but not common; several mature insects taken and one larva found on hackberry and reared to imago. The latter emerged June 14, and mature insects found on the wing early in July.

49. *Uranotes melinus* Hüb.—Fairly common in some years and extremely rare in others. Has been taken here in every month from May to October, though there are probably only two broods.

50. *Thecla edwardsii* Saund.—One specimen taken by Mr. F. H. Marshall, but date of capture lost.

51. *Thecla calanus* Hüb.—A single specimen taken July 5, 1912.

52. *Strymon titus* Fab.—Not observed at Omaha prior to 1912, but in July of that year it appeared in fair numbers; observed in different localities July 3, 5, 10, 14 and 20 and altogether about 20 specimens taken.

53. *Feniseca tarquinius* Fab.—Rare; 5 specimens in 5 years in 3 different localities. Taken in April, June, September and October.

54. *Gaeides dione* Scud.—Not very common; single brooded, appearing about June 20.

55. *Chrysophanus thoe* Bd.—Usually pretty common; double brooded, appearing about June 15 and again early in August.

56. *Cyaniris ladon* Cram.—Fairly common; summer form appears after middle of June.

56-a. *Cyaniris ladon,* var. *violacea* Edw.—Our spring form, and also fairly common; appears about April 15. It and *P. rapae* are our earliest butterflies, excepting such as hibernate.

56-b. *Cyaniris ladon,* var. *neglecta* Edw.—Late summer form; found in August and September and just about as abundant as the two earlier forms.

57. *Everes comyntas* Godt.—Very common; several broods; on the wing from first of May to the first of October.

58. *Hemiargus isola* Reak.—Common, especially during past two summers; several broods, for it is found from May till October.

59. *Amblyscirtes vialis* Edw.—Fairly common; first brood appears about the first of May, second brood about the middle of July.

60. *Ancyloxypha numitor* Fab.—Very common around water; first brood, about June 1; second brood, about middle of August.

61. *Atrytone hobomok* Harr.—Common; single-brooded; flies first three weeks of June. Identification in accordance with synopsis of species of this genus in Dyar's Review of the Hesperiidae of the U. S.

62. *Hylephila campestris* Bd.—Not very common; flies from August 20 till about the first week of October.

63. *Thymelicus otho,* var. *egeremet* Scud.—Fairly common; on the wing during the last half of July.

64. *Thymelicus cernes* Bd-Lec.—Our commonest skipper; on the wing from the very end of May till the middle of September almost without interruption, but most abundant in June and the last half of August, so it is likely that there are but two broods.

65. *Thymelicus alcina* Skinner—Identification somewhat uncertain; several specimens (♂) collected in July, 1909, and referred to this species; subsequently a series of *alcina* was collected in the western part of the state and when placed side by side with the Omaha specimens, differences were detected. Reference was then had to the original description of *alcina* and the western specimens were found to agree with it, leaving the identification of the Omaha specimens in doubt. The differences, however, are not great.

66. *Polites peckius* Kirby—Another very common skipper; flies with *cernes,* the seasons being about the same, and like it appears to be double-brooded.

67. *Euphyes verna* Edw.—Not found prior to 1912; one specimen taken July 3 and another July 5 of that year, in widely separated localities.

68. *Euphyes vestris* Scud.—Fairly common; appears at the very end of July and remains on the wing about three weeks; sometimes found also in early June, indicating probably two broods. Differs from var. *metacomet,* found in western part of the state, in being almost black.

69. *Lerodea osyka* Edw.—A single specimen (♂) taken by Mr. F. H. Marshall, Sept. 7, 1912, while collecting in company with the writer. Identified by means of Dyar's "Review of the Hesperiidae of the U. S." Specimen fresh and in perfect condition.

70. *Limochores pontiac* Edw.—A single specimen (♂) taken July 9, 1910. Specimen beautifully fresh, showing that this species was just beginning to emerge; unfortunately this locality—a marsh area—has not since been visited at the right season of the year for this species, and hence no further individuals have been taken or observed.

71. *Limochores dion* Edw.—While searching for *pontiac* on July 6, 1912, in the locality where the single specimen was found in 1910 (possibly a week too early), 5 specimens of *dion* (2 ♂ and 3 ♀) were taken, all of them fresh and perfect.

72. *Phycanassa delaware* Edw.—Apparently rare, as but three specimens have been taken, 2 on July 24, 1909, and 1 on July 10, 1912.

73. *Phycanassa arogos* Bd-Lec.—Found in only one locality so far—a piece of virgin prairie land—but quite abundant there. Flies during July.

74. *Epargyreus tityrus* Fab.—Extremely common; two broods, the first appearing about June 10, the second about the middle of August.

75. *Thorybes bathylus* Sm-Abb.—Common; found from May to September, no doubt double-brooded.

76. *Thorybes pylades* Scud.—Common; last half of June and early part of July.

77. *Pholisora catullus* Fab.—Very common; found from May to September; several broods.

78. *Pholisora hayhurstii* Edw.—Common; flies in company with *catullus* and its season is about the same.

79. *Thanaos persius* Scud.—Not common; specimens have been taken the latter part of April and early part of May, and also about the middle of July. All species of *Thanaos* herein listed have been identified by means of Dyar's "Review of the Hesperiidae of the U. S." in addition to colored plates.

80. *Thanaos brizo* Bd.-Lec.—Rare; occasionally found in the latter part of April and early part of May.

81. *Thanaos martialis* Scud.—Fairly common in the latter half of July, and also found (though not so common) in the first half of May.

82. *Thanaos juvenalis* Fab.—Our commonest *Thanaos;* at least two broods and possibly a third as it has been taken as early as April 3 and as late as Sept. 7 and in every month between these excepting July.

83. *Thanaos horatius* Scud.-Burg.—Rather rare; specimens have been taken in July and in Sept. & Oct.

84. *Thanaos terentius* Scud.-Burg.—Rather common; at least two broods; has been taken in April, May, July, Aug. & Sept., with April 29 as the earliest capture and Sept. 25 as the latest.

85. *Hesperia tessellata* Scudder.—One of our very common skippers; on the wing at all times from May till late in October.

The above list is without doubt incomplete and it is confidently expected that it will be materially added to in the future. During the season of 1912 seven species were added to it, they being as follows: *C. ismeria, P. vesta, T. calanus, S. titus, E. verna, L. osyka* and *L. dion,* and it seems likely that a dozen or more additional species may be found here.

Notes on some Beetles Reared from a Dead Elm Stick (Coleop.).

By Dayton Stoner, State University of Iowa, Iowa City, Ia.

A portion of a small, dead elm seedling which I found lying on my lawn in Iowa City on 19th October, 1912, was on 6th November, 1912, brought to the Natural Science Building of the State University of Iowa and placed in a loose-topped glass jar. This stick was about sixteen inches in length, one and one-half inches in diameter at the base and, in places, the bark had become somewhat loosened from the wood.

The temperature of the room in which the stick was kept varied considerably, fluctuating between 45 and 90 degrees Fahrenheit. In the bottom of the jar was placed a pledget of cotton which was moistened with water from time to time.

On 7th January, 1913, an adult female *Neoclytus erythrocephalus* Fab. emerged and on 10th January three more beetles of the same species. One of these, a male, attempted sexual union with a female and, after some difficulty, succeeded. The male clung to the female with his front legs and, as she walked about, often grasped one of her elytra along the sutural margin with his mandibles. He also assisted himself at times, with his mandibles by grasping the short, dorsal transverse ridges on the prothorax of the female. This characteristic was observed again in individuals that emerged at a later date.

Magdalis armicollis Say, a weevil, emerged on 16th January, 1913, from the stick of wood and on the following day another of this species emerged. In the meantime, two more *N. erythrocephalus* had emerged. Both weevils were removed from the jar as soon as discovered.

On 28th January, something over a dozen eggs of *N. erythrocephalus* were found partially hidden under a strip of bark that had been torn loose at one end. They were 1 mm. in length, roughly oblong-ovate in form, white in color and were attached to the wood by one end. A week later the eggs appeared to be developing and had assumed an iridescent appearance with a brownish spot, evidently the head of the developing larva, showing at one extremity.

All the eggs had hatched on 6th February, nine days after deposition.

On 14th February a female *Xylotrechus colonus* Fab. emerged, this making the third species secured from the stick. Up to this time the beetles that had emerged numbered thirteen.

Sometimes a number of *N. erythrocephalus* were kept alive in the jar for several days and, after the cotton in the bottom of the jar had been moistened, the beetles would come to it and chew some of the fine strands evidently for the purpose of extracting the water.

From 14th February until 15th March adults of *X. colonus* and *N. erythrocephalus* appeared at irregular intervals until, at the latter date, 15th March, the total number of beetles emerged was twenty-nine. Of these, seventeen were *Neoclytus erythrocephalus,* ten *Xylotrechus colonus* and two *Magdalis armicollis.*

The experiment, as carried out, shows, it seems to me, several points of interest:

1. The remarkably great number of beetles (twenty-nine) secured from such a small stick makes evident the extraordinary severity of the infestation.

2. The emergence of the beetles lasted over a considerable period of time, due in part, probably, to the fluctuation of temperature in the room.

3. *Neoclytus erythrocephalus* Fab. will breed under these somewhat artificial conditions.

P. S. March 24. I may add that, since sending in my manuscript, two more *Xylotrechus colonus* Fab. have emerged, thus raising the total number to thirty-one and the number of this species to twelve.

Observations on the Lepidoptera of St. Louis and Vicinity during 1912.

By the Members of the St. Louis Entom. Club.

Compiled by P. A. SCHROERS.

The collecting season started very auspiciously during the latter part of March, but did not keep its promises very long. From May 15th to June 15th the weather was cold and cloudy with chilly wintry nights; July had only a scattering of hot days, and the temperature during the first half of August and the whole of September was also below normal. Under these circumstances collecting seemed so little promising that very few members of the club carried on a systematic campaign.

The Rhopalocera were particularly observed by Mr. A. Knetzger, who noticed the following departures from the average occurrences; the following species appeared in far reduced

numbers: *Danais plexippus, Argynnis cybele, Phyciodes tharos* v. *marcia,* all the *Pyrmaeis, Pholisora hayhursti, E. lycidas* and *T. martialis. Junonia coenia* was scarce but the first specimen appeared during the first days of August, which is unusually early; the same remark applies to *Meganostoma caesonia.* The Papilios were far from plentiful, excepting *cresphontes* in one single locality a few miles north of the city.

On the other hand, *Thecla irus* and *Lycaena isola* were very common; the latter has always ranked amongst one of our scarcest insects here. *Nathalis iole* made a proverbial appearance every seven years or so, but it has been taken regularly for the last three years in fairly good numbers, always favoring the railroad tracks. *Amb. vialis, Eu. verna* and *Anea andrea* were also common, but of the last named the specimens observed were mostly females.

Dione vanillae, Calpodes ethlius did not reappear after their visit of 1911; these species cannot hibernate in this climate in any stage. The same seems to apply to *Thecla m-album, Terias mexicana* and others which have been seen or captured accidentally around St. Louis but never regularly enough to be included amongst our natives.

Still no sign of *Euchloe genutia* and *olympia* v. *rosa.* This is the ninth year that these pretty little insects have failed to show; they were quite common on the hills at Meramec Highlands, St. Louis County, during April. Some entomologists attribute their disappearance to the extensive forest fires which occurred in that vicinity in 1903. Others suspect the work of a parasite.

The Heterocera suffered a great deal from the low temperature of the nights and while all the usual species were present, most of them were very poorly represented. This was particularly true for the Sphingidae, *Hemaris diffinis* and *thysbe* excepted, the Saturnidae and Arctiidae with again the day fliers excepted, namely, *U. bella,* which occurred in swarms with *Scepsis fulvicollis.* The Ceratocampidae were all well in evidence, the writer caught many *E. imperialis, C. regalis, Anisota stigma* and *Dryocampa rubicunda, Adelo-*

cephala bicolor and *bisecta* at Creve-Coeur Lake. The genus *Schinia* yielded *trifascia, jaguarina, arcifera, chrysellus, lynx* and *nundina* a new record.

Two beautiful *Erebus odora* were observed by Mr. E. Schwarz resting on tree trunks at Meramec in August. His observations on the genus *Catocala* show that the collecting was very favorable up to the first of August, then *nil* until after the sixteenth, then normal to the end.

C. lacrymosa was particularly abundant with many beautiful variations. M. Schwarz took two specimens of v. *zelica*, one pair of v. *ulalume* and twelve v. *paulina;* v. *evelina* constituted about one-third of the whole booty of *lacrymosa*. *C. neogama, obscura* and *residua* were all very scarce; *C. epione, ultronia* and *amica* never so abundant. *C. innubens* v. *scintillans* represented about 25 per cent. of the *innubens* caught, against a proportion of 33 per cent. in 1911. *C. parta, consors* and *marmorata* give one specimen each.

As a new record we may mention *C. titania*, captured by Mr. McElhose some years ago and but lately identified in the collection of Mr. E. Schwarz.

Amongst other additions to the local list of nocturnals we find: *Apantesis figurata, Orthosia auriantiago, Melipotis versabilis, Melalopha apicalis, Schizura ipomoeae* and *Givira anna* (Dyar) six specimens, by the writer; *Eutrapela alciphearia*, by Mr. E. Schwarz and *Ufeus satyricus*.

Notes on some North American Noctuidae (Lepid.).

By F. H. Wolley Dod, Midnapore, Alta., Canada.

Hadena albiserrata Smith. (Jour. N. Y. Ent. Soc. XI, p. 8, 1903) = **H. loda** Streck.

Smith's description was made from a pair from Pullman, Washington, in the Rutger's College collection. Strecker's was a male from Seattle, and his name has preference by five years. I once thought the species was a strongly marked gray race of *versuta*, wherein I was wrong. It lacks all the bronzy tint possessed by even the grayest *versuta*. The orbicu-

lar is smaller, and ovate oblique instead of round or nearly so. In *versuta* the t. p. line is composed of a series of inward crenations. In *loda* they are inward dentations. This is not mentioned in either description. It occurs on Vancouver Island, usually rather sparingly, though it was reported to be abundant at Duncans during September and early October, 1911. I have a few scattered records from elsewhere in B. C., and Mr. Sanson has taken it at Banff, Alta. It is omitted from Hampson's Catalogue, but would probably find a place in *Eurotype* Hamps., as it seems to agree in structure with *contadina* Smith, and has the same general type of maculation. *Contadina* was known to Hampson only by a single specimen loaned from the Washington collection.

Hadena erica Smith (Can. Ent. xxxvii, 258, July, 1905).

I cannot see that this is anything more than a rather pale form of *characta* Grote. The type of the latter is a female in the British Museum from Nevada. Hampson correctly describes it as "grey-white, thickly irrorated with black, the base and medial area tinged with ochreous brown." His figure of it, the only example then in the collection, is too even, and the ochreous shades are too pronounced. *Erica* was described from a long series from Stockton, Utah, whence I have received considerable numbers. It is stated at the end of the description: "The species is allied to *characta* Grt., but differs obviously when a series is at hand." When I visited Prof. Smith's collection in January, 1910, his series under *erica* contained six specimens, which included three species. A pair labeled "Colo. Bruce." and a female "Gunnison Colo.," were *characta*. A female from Claremont, Calif., was *susquesa* Smith, and from the type locality be it observed! A male from the Sierras, and a Colorado female were a third species which I did not recognize. The male, by the way, bore a folded label *"antimoda* Smith type," a name never published. If this was the series which did duty for *characta* when *erica* was described, and on which the comparison was based, the "differs obviously when a series is at hand" must be admitted. The description of *erica* mentions an ochreous tint, but some specimens lack it almost entirely.

Hadena luteocinerea Smith.

This species, described from a single Montana male, appeared to me the same as the foregoing, nearer to typical *characta* than to the paler *erica*. Most of the black markings shown in Hampson's figure, copied from a colored drawing of the type, are erroneous.

Andropolia submissa Smith (Jour. N. Y. Ent. Soc. xix, 138, Sept., 1911) = **illepida** Grt. = **diversilineata** Grt.

Smith's description was made from five females from Provo, Utah, whence I have a long series agreeing fully with it. One of these, a male, with bipectinate antennae, I have compared with Grote's male type of *illepida* in the British Museum. Another, a female, I compared with the female type, referred by Hampson to *diversilineata* which he keeps distinct, principally as having well marked t. a. and t. p. lines. He also mentions a pale red-brown suffusion in *illepida*, not in *diversilineata* male. Smith comments at some length on these characters and Hampson's reference, in the paper above referred to, and admits that the red brown colouration is the only character that can possibly separate Grote's two names as species. Grote in his 1895 Check List eliminates the name *diversilineata* altogether as based on what Smith claimed was a patched specimen in Packard's collection, now at Cambridge, Mass. I happen to possess no Colorado specimens to which the reddish shading is attributed, but have carefully examined Grote's male type of *illepida* twice, and am satisfied as to my reference. The variation in my Utah and Arizona series is very considerable, but all the characters intergrade. The t. a. and t. p. lines are sometimes practically obsolete, though this is more frequently the case in males than in females. Some specimens have very little maculation at all, while others have it very distinct and contrasting. Such specimens have generally the whitest ground. Brown shades are evident in a few.

Polia resoluta Smith.

Described from a pair collected by Bruce in Colorado, and the male type is figured with the description. Sir George

Hampson refers *resoluta* to *illepida,* to which Smith objected. The male type is in the Washington Museum, the female in Smith's collection. I have a specimen compared with the male type, and so far as that is concerned consider Hampson's reference quite correct. The female type has a clearer, whiter ground than any I had before seen, and it seemed as if it might be distinct from the male. Hampson uses the generic term *Andropolia* Grt. for these species.

Polia speciosa Morr.

I have seen the type of this, a female from Cambridge, Mass., in the Graef collection at Brooklyn. I at once noted it as a pale, brightly marked and contrasting *Hadena devastatrix.* I communicated this note to Smith in March, 1910, at which time I was in correspondence with him concerning a number of points on which we had differed. After re-examining the type himself he wrote: "The species has nothing to do with *devastatrix.* Fortunately it has one hind leg left and this shows the Agrotid structure. It is a *Peridroma,* and very close to *praefixa.*" The Agrotid structure referred to of course meant tibial spines. This seemed to be equivalent to saying that *devastatrix* possessed tibial spines. I forthwith hunted through my series, and found that about fifteen per cent. of them had, varying from one to three on each hind tibia. As, therefore, the possession of hind tibial spines by *speciosa* does not disprove its being *devastatrix,* I must be guided by my original note.

Semiophora atoma Smith (Trans. Am. Ent. Soc. xxxiii, 126, April, 1907).

Described from a ♂ and nine ♀ ♀ taken at treacle by Mr. J. A. Grossbeck at Lakehurst, N. J. I have one of the female cotypes, which I have compared with the types in Smith's collection, and also with the *climata* series in the British Museum. I cannot see that the description applies to anything more than small poorly marked specimens of *climata,* of which Smith's male type has the antennae. Hampson makes *janualis* "ab. 2." of *climata,* "like typical form, but without the black streak in the cell." There are a pair of types of *janualis* in the British

Museum, and the reference appears to be correct, though this stands as distinct in Smith's list, and in Grote's 1895 list. Grote in the description laid emphasis on the pale discolorous reniform. It is the least marked form of the species which has received a name, and to this variety *atoma* will be most correctly referred. *Badicollis* stands as "ab. 1." in Hampson, as a very grey and strongly marked form, with black well developed. This is based on an Abingdon, Mass., specimen, which my notes refer to as a type, but as it is not so listed by Hampson, I must have been in error. Type *elimata* is about intermediate between these two extremes.

Setagrotis vocalis Grote.

Dr. Dyar in Proc. U. S. N. M. XXVII. 821, 1904 (Kootenai List), referred *planifrons* Smith and *congrua* Smith to this species, and correctly so. Grote's type is in the British Museum, a female from Colorado. Hampson figures a male of the same species. The figure is ochreous. *Congrua* was described from a single Oregon male. Hampson's figure of this is copied from a colored drawing of it, and is on the whole good, though a trifle exaggerated in color. The type is at Washington. *Planifrons* was described in the same paper from a single female from "Northwest British Columbia," from the Neumoegen collection, where I have seen it. Hampson's figure of this is also from a colored drawing, and has turned out pretty good, but a little too pale. I have compared Colorado specimens from my series with all three of the above types, and matched *vocalis* and *congrua* very closely indeed. I was not so successful with *planifrons*, but have two rather damaged females from Nanaimo, B. C., from the Taylor collection which are somewhat suffused and have a pronounced fuscous central shade, and one of these comes very close to the figure and is in accordance with my notes. Specimens from Kaslo, B. C., are darker blue-grey, and some of them have the central shade strongly developed.

Type *vocalis*, by the way, shows a central shade. I have pale specimens of this species from Provo and Eureka, Utah, and two from these localities are figured as *vocalis* by Messrs.

Barnes and McDunnough in their "Contributions," Vol. I. No. 4, pl. i, f. 16, and pl. v. f. 1. The species is a very variable one. The transverse lines, basal streak, black in the cell, the black or reddish-brown line on tegulae, and apparently also the transverse central shade, are variably present or absent. Smith's note in his Agrotid monograph with regard to *congrua* and *planifrons*, to the effect that, "there are so many differential characters that there is not the slightest danger of confusing them," based as it was on single specimens in a family even then well known to be very variable, was, to say the least of it, rather premature.

Invenusta Grote, type a female in the Brooklyn Museum, from Las Vegas, New Mexico (Snow), my notes say is a very even *planifrons* and has several times already been correctly referred to *vocalis*. Hampson places *vocalis* in *Lycophotia* Hübn. treating *Peridroma* Hübn. and *Setagrotis* Smith as synonyms.

Setagrotis filiis Smith (Trans. Am. Ent. Soc. xxxiii, 127, April, 1907) = **vernilis** Grote.

Filiis was described from a single male from Pullman, Washington, and said to be "allied to *vernilis* in type of maculation." I saw the type in Smith's collection. Associated with it, and correctly I thought, was a female from Laggan. I noted it as probably an exceptionally blue-gray form of *infimatis*. *Vernilis* was at that time unknown to me, and I had another species under the name in my collection. In the fall of the same year I received the form from Mr. N. B. Sanson, of Banff, Alta. In Rep. Ent. Soc. Ont., 1910, I recorded Mr. Sanson's capture as *filiis*, and suggested that it might be a form of *infimatis*. The species I recorded from Banff as *vernilis* at the same time was *congrua* or something more nearly allied to that than to *infimatis*. The following year Mr. Sanson took a nice series, and I noted the extremely close resemblance of the form to Hampson's figure of *vernilis*. I took a specimen with me to the British Museum, and found it almost exactly like Grote's type from Colorado, which is the specimen figured by Hampson. It is a very close ally of *infi-*

matis, though much darker blue-gray than any of my long series of that species from the Pacific Coast, and whilst the maculation is practically identical, it is less strigate owing to the markings being much less distinct. It has no sienna-brown shades. As in *infimatis* the long narrow orbicular is sometimes confluent with the lower portion of the reniform, which also occasionally runs back on or below the median vein. A central shade is occasionally discernible in both species. I have no note as to what stood as *vernilis* in Smith's collection, but concerning that of the Washington Museum my note reads, "Hampson's figure is much bluer gray than any here." The figure represents the Banff form exactly, but is a little too brown in tone, probably the fault of the process.

Setagrotis dernarius Smith.

This was described on the page following *filiis,* from a single pair. The male was from California, without exact locality, and was sent to Smith for identification by Sir George Hampson. It is now in the British Museum as the male type. The female, from Easton, Washington, is the other type, in the Rutger's College collection. Smith mentions after the description that spines are obvious on the fore tibiae of the male, but not of the female, and that Sir George Hampson would therefore refer the species to *Lycophotia* rather than *Anomogyna,* in which he places both *infimatis* and *vernilis,* which are without fore tibial spines. I have examined that male type for these spines, but failed to find them, and believe Smith to have been mistaken. I consider both specimens to be rather unusually reddish-brown examples of *infimatis.*

Setagrotis elata Smith = **Agrotis scandens** Riley.

Elata was described from two males and a female from Colorado. A pair of types are at Washington, and a male co-type at Rutger's College. There is a pair of *scandens* at Washington lacking locality labels, marked "types," with the museum red label, which are presumably Riley's types. Smith must have completely forgotten what *scandens* looked like when he described *elata.* I have compared the types with each other and have a specimen compared with them, and never had

for one moment the least doubt of their identity, nor, I fancy, could anyone else examining them with an unprejudiced eye. It is strange that the reference has not been made before. *Elata* was known to Hampson only by a figure, on the strength of which he made it congeneric with *scandens,* referring both to *Lycophotia* Hübn. The frons is smooth, but the spines at the extremity of the fore tibiae are extremely stout, and in some specimens two or three of them are very decided long claws. Several species of *Euxoa* appear to have similar claws, not found in any *Peridroma* which I have yet examined, the latter genus being treated by Hampson as a synonym of *Lycophotia.*

Peridroma demutabilis Smith.

This was described in 1893, and there are a pair of types in the Washington Museum from San Bernardino Co., Calif., and according to my notes, a male type from the same locality is in Smith's collection. Of the Washington types, the male is yellowish, but is stained. This, and two other males from Arizona associated with it, have thoracic vestiture hairy. The female type is not yellowish, and has thoracic vestiture distinctly scaly. However, they looked to me the same species. I find the vestiture very variable in some Agrotids. The antennae of the male type I should describe as serrate-fasciculate, the serrations very coarse and short. The Arizona specimens have the serrations less coarse, that is to say, less like merely well-marked joints. Every gradation can be found between a merely ciliate antenna in a noctuid, and one that is almost serrate-fasciculate, and the thickness of the joints, or length of the serrations, often varies considerably in a species. Hampson lists an Arizona male, though the key gives his figure as female, placing it in a group of *Lycophotia* with male antennae ciliate only, which by male type is incorrect.

Agrotis biclavis Grt. was described in 1879, apparently from a single Arizona male. The type I have seen in the British Museum, and it is slightly ochreous, as described by Grote, though this color is exaggerated in Hampson's figure. The antennae are finely serrate-fasciculate, or, as Grote puts it, "brush-like with the joints nodose."

I have an Arizona male which I have compared with all the above types, and the evidence seems much in favor of their all being one species, though I do not feel sufficiently sure of it to venture the direct reference at present. My own specimen has certainly the frons of *Euxoa*.

A very distinct species appears to have been mixed up with *biclavis*, probably by Grote himself. Of this there are a male and two females in the Henry Edwards collection from the Colorado Desert, and a series in the U. S. National Museum. It is a species allied to *lagena* Grt., about the same size, and with similar male antennae, that is, ciliate only.

Hadena devastatrix Brace.

Hampson places this in the genus *Sidemia* Staud., the only other North American species which he makes congeneric with it being *longula* Grote. *Sidemia* finds a place in Volume vii of the Catalogue, the first of three volumes devoted to the Acronyctinae, a large subfamily characterized by the trifid neuration, combined with spineless tibiae and smooth eyes not surrounded by bristle-like hairs. But as I have pointed out in Can. Ent. xliii, 233, July, 1911, and also in a former note in the present paper under *Polia speciosa, devastatrix* has not infrequently a spine or spines on the hind tibiae. Had Sir George Hampson noticed this, he would presumably have treated the species in Vol. iv.

During my recent visit to the British Museum I noted the strong superficial resemblance of *devastatrix* to the European *abjecta* Hbn., which Hampson makes a synonym of *oblonga* Haw., and refers to genus *Trachea* Ochs. in the same volume. I examined many of the specimens of *abjecta* carefully, and found that several of them had hind tibial spines. Until then I had overlooked the fact that Guenée had treated *devastatrix* as a variety of *abjecta*, and that they are considered synonymous in Staudinger's Catalogue, and given a wide distribution in the Northern hemisphere. The descriptions I have read of the larvae of the two sound a little different, and that of *abjecta* is said to confine itself closely, in Britain, to grasses growing on salt marshes and tidal estuaries. In this country,

devastatrix is of universal distribution as far south as Arizona, and is very largely a grass feeder.

Tutt, in "British Noctuae and their Varieties," Vol. I, p. 111, refers to a British variety of *abjecta* which he calls *nigro-distincta,* as "blackish-gray with distinct markings," which he says is the way Guenée described his "*abjecta* var. B." from New York and Canada, which has been referred to *devastatrix*.

Agrotis marshallana Westwood.

This name stands in Smith's Catalogue as a synonym of *devastatrix,* on the authority of Walker, who appears to have referred the name to his *Mamestra contenta.* The synonymy unfortunately is copied by Sir George Hampson. The type of *contenta* is a male from Nova Scotia, and is a specimen of *devastatrix,* and so also is the Trenton Falls type of *Mamestra ordinaria* Walk., described at the same time. Both are in the British Museum. It was puzzling to find "var. *marshallana* Westwood" referred by Tutt as a form of *nigricans* Linn. Whilst in England last year I looked into the matter. I found the description and a figure in Humphrey & Westwood's "British Moths," which, however, was dated 1843 instead of 1857, as given in Smith and Hampson. (The date of the work is given by Tutt as 1841-1844.) The description is as copied by Tutt, and its author states that it was made from a single specimen from Mr. Marshall's collection, by whom it had been taken some years previously on a tree stump at Charing, in Kent. The figure certainly did not recall *devastatrix* in the least. At the British Museum, whilst looking through some British Noctuidae not installed in the general collection, I came across a female, under *nigricans,* labeled "ab. *marshallana* Westw." from the Stephens' collection, and another very similar specimen associated with it from the Mason collection. The latter specimen had the abdomen and secondaries detached, but they were replaced, and both specimens were then in excellent condition. Sir George Hampson and Mr. Richard South, who were present at the time, agreed together that one of these specimens—I am not sure which—was, within every probability, the original type, and it was so labeled forthwith. Both specimens were *nigricans* or *tritici* beyond a doubt, and

these two names have been treated as one species in recent British literature.

Walker's synonymy must therefore be looked upon as one of the many quite groundless references made by him, and the synonym removed from *devastatrix*.

Mamestra tincta Brahm.

This name appears in Smith's 1903 Check List (No. 1996), on what authority I am wholly at a loss to discover. It is a well-known European species, common in the British Isles. It bears some resemblance to our *purpurissata*, though that has a still nearer old world ally in *advena* Schiff., of which Staudinger lists *purpurissata* as a North American variety. But whereas our species has male antennae strongly serrate-fasciculate, almost pectinate, both *tincta* and *advena* have them ciliate merely.

The Occurrence of the Australian Cattle Tick and the Brown Dog-tick in Key West, Florida (Acarina, Ixodoidea).

By F. C. Bishopp, U. S. Bureau of Entomology.[1]

The finding of specimens of the Australian cattle tick, *Margaropus annulatus australis* Fuller, on native cattle in Key West, Florida, by Mr. G. A. Runner, of the Bureau of Entomology, is not only of interest but also is deserving of consideration from an economic point of view. These ticks were taken on cows in the city of Key West on February 8, 1912. They were examined by the writer and found to be identical with the form of cattle ticks which occurs in the West Indies, Central America, Australia and other parts of the world, but which has not been previously taken in the United States.

In 1901 Salmon and Stiles[2] reported the occurrence of this tick in Porto Rico, and in 1909 the writer found it to be a severe pest of live stock in the vicinity of Tampico, Mexico.[3]

[1]Published by permission of the Chief of the Bureau of Entomology.

[2]The cattle ticks (Ixodoidea) of the United States.—Seventeenth Ann. Rept. Bu. of Animal Ind., U. S. Dept. Agr., for 1900, pp. 432-433, 1901.

[3]Hooker, W. A., Bishopp, F. C. and Wood, H. P. The life history and Bionomics of some North American ticks.—Bull. 106, Bu. of Ent., U. S. Dept. Agr., p. 118, Sept. 7, 1912.

At Victoria, Tamaulipas, Mexico, however, this form was not found, while our own variety, *annulatus* proper, was taken on cattle there. More recently (March and April, 1912) Mr. G. N. Wolcott took the Australian cattle tick, as this form is commonly called, in numbers on horses and cattle, and a single female (one-third engorged) on an Angora goat in the Province of Pinar del Rio, Cuba. This variety has also been reported from practically all of the other islands of the West Indies.

With the close trade relations maintained between Cuba and other West Indian Islands and Key West, it is not difficult to account for the introduction of the tick in that port. There is always danger of this form being brought into southern Texas from Mexico, but the likelihood is equally great of its establishment on the mainland of Florida, from the infestation now existing in Key West. This is made more easily accomplished now that Key West is placed in more intimate connection with the mainland by the East Coast Railway.

The importance of the establishment of *M. annulatus australis* in the United States is problematical. There is reason to believe that it would successfully breed in most of our Southern States. Certain habits of this form make its presence in the United States a grave danger. It is known in other countries to have much more generalized host relationships than has the variety common to this country. For instance, Rohr[4] says that in Brazil although cattle are the principal hosts, the horse, goat, sheep, dog, rabbit and man are attacked also. Adults of both sexes were found on dogs in Jamaica by Newstead.[5] He also says that the larvae are a great pest of man there and that it is the common belief that this stage will attack any vertebrate animal.

It is possible, of course, that this form if introduced into the United States may soon take on the characters and habits

[4]Estudos sobre Ixodidas do Brasil—(Trabalho do Instituto do Oswaldo Cruz), Rio de Janeiro, p. 90, 1909.

[5]Ticks and other blood sucking Arthropoda. Reports of the twenty-first expedition of the Liverpool School of Tropical Medicine, Jamaica, 1908-1909.—Ann. of Trop. Med. and Parasitology, Vol. III, No. 4, p. 436, Nov. 1909.

of *annulatus* proper and prove to yield to the same eradicative measures as are being employed against that tick. A change in form of the females of the Australian cattle tick when bred for several generations in the United States has been reported by Salmon and Stiles.[6] The male characters, however, did not appear to be modified. Tests were not made to determine if modifications in the host habits occurred. Should this habit of feeding on a large number of hosts persist, the methods of eradicating the North American cattle tick would be much less effective against this form if it becomes established in this country. There is little doubt that eradication of *M. annulatus australis* could be accomplished comparatively easily now that it is probably confined to Key West, and this question should be given serious consideration.

The brown dog-tick, *Rhipicephalus sanguineus* Latr., has been found commonly in extreme southern Texas, but until recent collections were made in Key West, Florida, by Mr. G. A. Runner, the species was not known to occur in other parts of the United States. On February 8, 1912, Mr. Runner took a nymph and several males and females on a dog in Key West and on the same date and in the same city he found five females (one-third engorged) on a donkey. This species is widely distributed in tropical and subtropical countries, and has been recorded from a large number of hosts. In the United States it was previously taken on the dog only. In February and March, 1912, Mr. G. N. Wolcott found this tick commonly on dogs in Santiago de las Vegas and Pinar del Rio, Cuba. Specimens previously collected in Cuba were referred by Prof. Neumann to *R. bursa*. It is probable that the infestation at Key West was introduced from Cuba or some of the other West Indian Islands, in all of which the species occurs.

This tick is often an important pest of dogs but seldom becomes injurious to other animals. It would probably breed in all of the Gulf States, but is not likely to become a serious pest here.

[6]The cattle ticks (Ixodoidea) of the United States—Seventeenth Ann. Rept., Bur. of Animal Ind., U. S. Dept. Agr. for 1900, pp. 432-433, 1901.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., OCTOBER, 1913.

A Utilitarian Value of Entomology.

In the advertising pages of one of the oldest and largest popular American monthly magazines, during the past summer, there appeared a full column advertisement headed "Bitter Root Valley offers you Health, Freedom and Fortune!" It went on to describe the handsome profit to be obtained from investing in apple and cherry orchards offered for sale by the exploiting company and laid emphasis on the "health, independence and ideal environment in which to live and be happy" which, with this "generous competence," "make up the sum total."

The location of Bitter Root Valley is nowhere stated in this advertisement. That, perhaps, is one of the items of this opportunity which the reader of the advertisement is urged to investigate.

The entomologist, reading this alluring proposition, will perhaps think of Bitter Root Valley in western Montana where, according to publications of the U. S. Department of Agriculture, Rocky Mountain spotted fever "appears in its most virulent form;"* where "the death rate [therefrom] is about 70 per cent;"† where "it was estimated in 1904 that 200 cases

*Circular No. 136, Bur. of Ent., U. S. Dept. Agr., p. 1, March 31, 1911.

†Bull. 105 of the same, p. 12, Nov. 17, 1911.

of the severe type of the disease had occurred up to that year . . . [which] means a loss of about 140 lives in this small valley. At the present time, with an increase in the population of the valley, it is estimated that about 20 cases of the disease occur annually. This means a loss of about 15 lives each year and this loss is certain to increase as the population of the valley becomes larger."‡

It may be that the health-offering Bitter Root Valley is not in Montana and we have no wish to hinder the agricultural development of any valley whatsoever. We do suggest, however, that some knowledge of entomology and of the relations of ticks and insects to disease is of practical and utilitarian value and should be employed by the "investigator" of proferred investments.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Changes of Address.

The address of Mr. C. A. Frost is now 26 Pond St., South Framingham, Mass., instead of 40 Grant St.

The address of Prof. J. M. Aldrich is now Experiment Station Building, Lafayette, Indiana, instead of Moscow, Idaho.

The address of Mr. Francis X. Williams is now Bussey Institution, Forest Hills Station, Jamaica Plain, Massachusetts, instead of Museum Building, Lawrence, Kansas.

Lepidopterous Eggs From the Stomach of a Wren.

August 18, 1912, I found near Nelson, North Queensland, a male of the little wren *Cisticola exilis* lying dead upon the ground; its stomach contained, besides adult and larval insects of several orders, about three dozen green lepidopterous eggs, probably those of a moth. They appeared to be uninjured and I carefully kept them; on August 20 an examination of them was made and some were marked with small pink dots which seemed to indicate development. However, by more careful examination it appeared that these dots were really the embryos of parasites of the genus *Trichogramma* (only an antenna was clearly made out which resembled that organ in the genus named). Development did not advance farther.—A. A. Girault, Nelson, North Queensland.

‡Ibid., p. 14.

The Zimmermann Collection of Coleoptera.

The statement in the Canadian Entomologist, Vol. XXI, p. 53, 1889, that the Zimmermann Collection of Coleoptera is in Harvard College, probably refers to the American species only, as the exotics are in the collection of The Academy of Natural Sciences of Philadelphia. Mr. Zimmermann's Diary and four manuscript catalogues, in which the specimens are numbered in an interrupted series from 1 to 17351, are also in the possession of the Academy. The numbers omitted may be in the books referred to by Dr. Hagen in his account of this man's life and collection. Mr. Zimmermann's scheme was to give each species, which he received, a number, which was placed on the pin of one specimen, together with a piece of colored paper, using a different colored paper for each additional lot received, whether from the same locality or not. The data in the catalogues consist of the name of the species, from whom received, and when obtained, in Roman letters, and the exact locality, with an occasional remark, in German script. This method saved much time in labeling and was very good until the specimens accidentally strayed from the numbered individual or the catalogues were misplaced.

Many of the specimens are from Schaum, Sturm, Burmeister, Melly, and Perkins, but very few of the American species have been found in the Academy's cabinet.—E. G. Vanatta.

Mantid Eggs Apparently Eaten by Birds (Orth.).

During a trip up Pyramid Mountain opposite Nelson, North Queensland, August 17th, 1912, I found nearly a half dozen large eggmasses of a mantid, of the form usual to the common North American species, attached to twigs of young trees and which appeared to have been partly excavated by a bird of some kind; the excavation sometimes was directly into the side, at others longitudinally or axially. The holes were round in outline, subconical and about 3/8-inch diameter or somewhat less. Later, on August 24, I found one of these masses torn into strips and incorporated into the substance of the nest material of an Australian Robin. Also on August 29, 1912, Mr. Alan P. Dodd called my attention to the nest of a honeyeater which was lined interiorly with the golden yellow-green frothy material surrounding the eggmasses. Thus, it is most probable that birds use this material and other parts of the eggcase for building material, instead of for food.—A. A. Girault, Nelson (Cairns), North Queensland.

Hymenoptera Chalcidoidea Eaten by Birds.

From the stomachs of several birds shot in the forests about Nelson, North Queensland, to wit, the wren *Cisticolor exilis* (pteromalids) and the honeyeater? *Pseudogerygone* species (chalcidids) and several others, a few chalcidoids were taken and an occasional wasp—A. A. Girault, Nelson, North Queensland.

Ants Crossing Water (Hymen.).

In a letter to "Nature" (June 26, 1913, p. 425), Mr. John C. Willis of Rio de Janeiro, mentions that a fly trap being found covered with ants, it was put on a finger bowl which was placed in a plate of water. The ants in coming to the edge of the water, ran around the bowl until seemingly convinced there was no way across, and then calmly "took to the water" and ran across it by the aid of surface tension, without "getting their feet wet." They soon returned, crossing in the same way, and this went on regularly, a steady procession crossing the water.

A Dragonfly Depositing Eggs in a Rainpool Over Concrete (Odonata).

On April 16, 1913, I observed a dragonfly hovering about a very shallow pool of water on a concrete pathway, occasionally darting rapidly down to it and dipping the end of the abdomen into the pool in the characteristic manner of oviposition. The species was unknown to me; no eggs could be found but the pool was full of debris which would make it difficult to find them. The sun was shining brightly (8.30 A. M.) and the pool had completely dried after several hours.—A. A. Girault, Nelson, North Queensland.

Some Colorado Dragonfly records (Odonata).

Recently Mr. W. J. Gerhard sent me some dragonflies collected by him near Denver, Colorado, about the middle of July, 1909.

Mr. Gerhard's brief field notes, on the dates of interest in this connection, are as follows:

July 13, 1909. At Berkeley Hills, a suburb of Denver. The edge of a small lake or pond yielded nothing of interest save dragonflies.

July 14, 1909. Berkeley Hills.

July 15, 1909. Berkeley Hills and Clear Creek (the latter about ¾ of a mile from Berkeley Hills).

July 16, 1909. Berkeley Hills and Clear Creek.

July 17, 1909. Clear Creek.

Hetaerina americana, 5 males, 2 females; July 17, 1909.
Argia vivida, 1 female; July 17, 1909.
Amphiagrion saucium, 5 males, 2 females; July 15, 17, 1909.
Enallagma clausum, 1 male; July 16, 1909.
Enallagma calverti, 1 male; July 13, 1909.
Enallagma carunculatum, 1 male; July 13, 1909.
Enallagma civile, 1 male; July 13, 1909.
Ischnura damula, 5 males, 4 females; July 13, 1909.
Ophiogomphus severus, 1 male, 1 female; July 14, 17, 1909.
Sympetrum semicinctum, 4 males, 3 females; July 13, 14, 16, 17, 1909.
Sympetrum corruptum, 2 females; July 13, 14, 1909.
Libellula pulchella, 1 female; July 16, 1909.

E. B. Williamson, Bluffton, Indiana.

The True Male of Nehalennia integricollis and N. pallidula, n. sp. (Odon.).

In describing *Nehalennia integricollis* in the NEWS for July last, page 312, from a female type, a male from Haulover, Florida, was doubtfully referred to this species and the differences, other than sexual, between it and the type were pointed out, page 314. On June 27 and July 2, at Malaga, New Jersey, I obtained three pairs of *integricollis* and a number of other individuals of both sexes. The males so obtained are the true *integricollis,* are much like the females in color, and consequently quite different from the Haulover male. To the Haulover male a *new name* must therefore be assigned, and PALLIDULA, in allusion to the narrower metallic green area of the thoracic dorsum is suggested; figures 7 and 11, page 313, illustrate the appendages of *pallidula* male.

Some additional notes on *integricollis* follow. The words "Superior appendages ♂ longer than inferiors," must be stricken out of the character of group I, page 311, as in true *integricollis* ♂ the superior appendages are not longer than the inferiors, although this is the case in *atrinuchalis, speciosa, selysii* and *pallidula.*

In the recently killed *integricollis* ♀ the eyes are olive green above becoming bluish-green on the middle third and yellowish-green below. Genae below the level of the base of the antennae very pale blue and a slender finger-like prolongation of this color runs upward each side into the dark metallic green of the rear of the head. The anterior surface of the frons, the rhinarium, the bases of the mandibles and the labrum are pale bluish, the last with a transverse basal black stripe. The pale transverse occipital line not enlarged at its extremities. The sides of the thorax and of abdominal segments 1-7 or 8 greenish-yellow, or in the tenerals pinkish.

In the recently killed ♂ *integricollis* the eyes are blue-black above and become increasingly paler blue to the under surface. The remainder of the head is colored as in the ♀ described above. The metallic green of the dorsum of body generally (including the head), is darker than in the ♀ owing, partly at least, to the admixture of more purple. Thoracic dorsum metallic green reaching laterad beyond the humeral suture as in the ♀. Sides of the thorax and of abdominal segments 1-6 pale bluish, of 7 and 8 yellowish, or of 8 bluish. Dorsum of abd. seg. 8 dark metallic green with no pale dorsal spots; 9 and 10 blue, 9 with a metallic green stripe on each side of dorsum reaching from base (where they are narrowly confluent with each other) one-half to two-thirds way to the hind end, 10 with a transverse basal black line. Hind dorsal margin of 10 cleft in the middle and spinulose. Appen-

dages as shown in the accompanying figures, resembling those of *irene* and *gracilis* (cf. page 313). The male is like the ♀ also in having *two* antenodal cells. Abd. 18.5-19.5, hind wing 11.5-12.5 mm.

In the teneral ♂ the pale colors of the body including the eyes are pale violaceous.

The type of this description of *integricollis* ♂ is now in the collection of the Academy of Natural Sciences of Philadelphia.

N. integricollis was taken at Malaga, on the dates mentioned, at the southwest corner of the pond made by damming Scotland Run, a branch of the Maurice River. It was flying among the abundant pickerel weeds (*Pontederia cordata,* var. *angustifolia*) and white water lilies (*Castalia*) then in bloom and was associated with *Telagrion daeckii* and numerous *Ischnura posita,* while *Pachydiplax longipennis* and *Libellula incesta* flew above.

PHILIP P. CALVERT.

The Druce Collection of Lepidoptera.

The magnificent collection of butterflies and moths, with its hundreds of types, formed by the late Herbert Druce, Esq., has passed into the Joicey collection, at "The Hill," Witley, Surrey, with the exception of the Lycaenidae and Hesperidae, which are retained by Hamilton H. Druce, Esq.

Entomologists are cordially invited to use the collection for naming and comparing.

A. NOAKES, for J. J. JOICEY, ESQ., The Hill, Witley, Surrey, England.

Material Wanted—Lepidoptera.

I am preparing a Revision of the Heodina (Chrysophanids or coppers) and there are several American species I do not possess, viz: *Tharsalea arota, Heodes fieldeni, Chalceria cupreus, snowi and rubidus, Satyrium fuliginosa.* I only possess very few specimens of *Gacides, xanthoides, editha* and *gorgon.*

I should be very grateful if any Lepidopterists would be so good as to send me these species for which I would make return in Exotics or Palæarctic species, or I would pay cash.—G. T. BETHUNE-BAKER, 19 Clarendon Road, Edgbaston, England.

The Audubon Entomological Club.

On May 27, 1913, the Audubon Entomological Club was organized at the office of the Bureau of Entomology at Audubon Park, New Orleans, La., by E. R. Barber, Dr. Wm. E. Cross, J. R. Horton, W. V. King and T. E. Holloway. The Club will afford its members an opportunity for social reunion, but the principal object will be for the discussion of entomological work. It is planned to have neither officers nor a constitution, as these are regarded as unnecessary for the purposes of the organization, which is altogether informal and not

representative of any special group of workers, though most of the members are connected with the Bureau of Entomology. On June 3, the members met at a well known restaurant in New Orleans for dinner, and on this occasion the name of the Club was chosen and a general plan of work was outlined. The meetings will be held hereafter at intervals of two weeks, and at each meeting the discussion will be led by one of the members, who will talk on a given subject.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **4**—The Canadian Entomologist. **7**—U. S. Department of Agriculture, Bureau of Entomology, Washington. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Comptes Rendus, l'Academie des Sciences, Paris. **21**—The Entomologist's Record, London. **22**—Zoologischer Anzeiger, Leipzig. **25**—Bolletino, Musei di Zoologia ed Anatomia Comparata d. R. Universita di Torino. **35**—Annales, Societe Entomologique de Belgique. **38**—Wiener Entomologische Zeitung. **40**—Societas Entomologica, Zurich. **42**—Journal, Linnean Society, Zoology, London. **43**—La Cellule. **46**—Tijdschrift voor Entomologie. **50**—Proceedings of the U. S. National Museum. **51**—Novitates Zoologicae, Tring, England. **56**—Mittheilungen, Schweizerischen entomologischen Gesellschaft, Schaffhausen. **59**—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. **73**—Archives, Zoologie Experimentale et Generale, Paris. **74**—Naturwissenschaftliche Wochenschrift, Berlin. **78**—Gardeners' Chronicle, London. **79**—La Nature, Paris. **86**—Annales, Societe Entomologique de France, Paris. **87**—Bulletin, Societe Entomolo-

gique de France, Paris. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **102**—Proceedings of the Entomological Society of Washington. **113**—Archives Italiennes de Biologie. **119**—Archiv fur Naturgeschichte, Berlin. **153**—Bulletin, American Museum of Natural History, New York. **161**—Proceedings, Biological Society of Washington. **166**—Internationale Entomologische Zeitschrift, Guben. **172**—The American Museum Journal, New York. **173**—Die Grossschmetterlinge der Erde, Fauna Americana, von A. Seitz, Stuttgart. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **189**—Journal of Entomology and Zoology, Claremont, Calif. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **216**—Entomologische Zeitschrift, Frankfurt a. M. **223**—Broteria, Revista de Sciencias Naturaes do Collegio de S. Fiel. (Ser. Zoologica). **228**—Georgia State Board of Entomology, Atlanta. **231**—Annuaire, Musee Zoologique de l'Academie Imperiale des Sciences de St. Petersbourg. **239**—Annales, Biologie Lacustre, Brussels. **243**—Yearbook, Department of Agriculture, Washington, D. C. **251**—Annales, Sciences Naturelles, Zoologie, Paris. **264**—Boletin del Ministerio de Agricultura, Buenos Aires. **269**—Memoirs, Department of Agriculture in India. Entomological Series, Calcutta. **273**—Proceedings, Royal Physical Society ...., Edinburgh. **275**—Philippine Journal of Science, Manila. **298**—Ofversigt, Finska Vetenskaps-Societetens Forhandlingar, Helsingfors. **313**—Bulletin of Entomological Research, London. **349**—Zoologische Annalen. Zeitschrift fur Geschichte der Zoologie, Wurzburg. **350**—Bulletin from the Laboratory of Natural History of the State University of Iowa, Iowa City. **369**—Entomologische Mitteilungen, Berlin-Dahlem. **394**—Parasitology, Cambridge, England. **411**—Bulletin of the Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington, D. C. **422**—Coleopterologische Rundschau, Wien. **432**—The Civic Federation of New Haven, Conn.

GENERAL SUBJECT. **Aichberger, R. v.**—Das gehirn eines niederen insektes, **74**, xii, 347-49. **Bishopp, F. C.**—Some important insect enemies of live stock in the U. S., **243**, 1912, 383-396. **Brehme, H. H.**—Butterflies and other insects noted at Barnegat Pier, **411**, viii, 75-6. **Brocher, F.**—Recherches sur la respiration des insectes aquatiques, **239**, v, 218-258. **Chase, W. W.**—Principal insects and diseases of the apple in Georgia, **228**, Bul. 38, 58 pp. **Chittenden, F. H.**—Insects injurious to the onion crop, **243**, 1912, 319-334. **Coupin, H.**—Les pleurs de sang singulier moyen de defense des insectes, **79**, xli, 402-03. **Crampton, C. B.**—Ecology, the

best method of studying the distribution of species in Great Britain, **273,** xix, 33-36. **Dow, R. P.**—The rector of Barham and his times, **411,** viii, 68-74. **Franck, G.**—A wandering collector's narrative, **411,** viii, 62-67. **Goldi, E. A.**—Die bisherige anschauung bezuglich der homologie der insekten-mundteile mit den derivaten des spaltfusses...., **56,** xii, 146-151. **Haskin, J. R.**—Attacks on insects and allied questions, **21,** 1913, 167. **Hewitt, C. G.**—The imperial bureau of entomology, **4,** 1913, 171-74. **Hooker, C. W.**—Obituary, **179,** vi, 334-36. **Jacobi, A.**—Mimikry und verwandte erscheinungen. Fr. Vierweg & Sohn in Braunschweig. 1913, 215 pp. (Bd. 47 of "Die Wissenschaft.") **Jehn, H.**—Die praparation gruner raupen, **216,** xxvii, 58-9. **Keller, O.**—Die Antike Tierwelt. 2d Bd. Leipzig, 1913. Verlag von W. Engelmann. (Insecta & Arachnida, 395-484). **King, H. H.**—Note on an entomological store-box suitable for use in the tropics, **313,** iv, 85. **McAtee, W. L.**—Relation of birds to grain aphides, **243,** 1912, 397-404. **Maxwell-Lefroy & Finlow.**—Inquiry into the insecticidal action of some mineral and other compounds on caterpillars, **269,** iv, 269-327. **Quaintance, A. L.**—Remarks on some of the injurious insects of other countries, **102,** xv, 54-83. **Timberlake, P. H.**—Preliminary report on the parasites of "Coccus hesperidum" in California, **179,** vi, 293-303. **Townsend, C. H. T.**—A new application of taxonomic principles, **180,** vi, 226-232. **Weiss, H. B.**—Apperceptional expectancy as a factor in protective coloration, **4,** 1913, 193-4. **Wesenberg-Lund, C.**—Fortpflanzungsverhaltnisse: Paarung und eiablage der susswasserinsekten. (Fortschritte der Naturwissenschaftlichen Forschung, viii, 161-286, 1913). **Ziegler, H. E.**—Ueber die neue nomenklatur, **349,** v, 255-265.

Valette, L. H.—Apuntes descriptivos sobre algunos invertebrados encontrados en un viaje a las Islas Orcadas, **264,** xv, 293-306.

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APTERA AND NEUROPTERA. **Bugnion, E.**—Le bruissement des termites, **56,** xii, 125-139. La differenciation des castes chez les Termites, **87,** 1913, 213-218. **Campion, H.**—Another abnormal dragonfly wing, **9,** 188-89. The antenodal reticulation of the wings of Agrionine dragonflies, **1,** 1913, 220-224. **Ris, F.**—Nochmals die Perlide "Capnioneura nemuroides" und einige bemerkungen zur morphologie der perliden, **369,** 1913, 178-185. **Smith, L. W.**—The biology of Perla immarginata, **180,** vi, 202-212.

Bacon, G.—A species of Collembola found with termites, **189,** v, 113. **Bartenef, A. N.**—Contributions to the knowledge of the sp. of the gen. "Sympycna" and their subdivisions (English), **231,** 1912, 144-164. **Cockerell, T. D. A.**—Two fossil insects from Florissant, Colorado, with a description of the venation of the Aeshnine dragonflies, **50,** xlv, 577-583. **Hood, J. D.**—Nine new Thysanoptera from the U. S., **161,** xxvi, 161-66. Two new Thysanoptera from Porto Rico, **420,** i, 65-70. **Longinos Navas, R. P.**—Crisopidos sudamericanos, **223,** xi, 73-104 (cont.). **Martynov, A. B.**—On two collections of Trichoptera from Peru (English), **231,** 1912, 1-40. **Valette, L. H.**—(See Arachnida). **Walker, E. M.**—New nymphs of Canadian Odonata, **4,** 1913, 161-170.

ORTHOPTERA. **Meijere, J. C. H. de**—Uber das ausschlupfen der Mantiden, **46,** xvi, 62-68. **Ramme, W.**—Ueber einen zwitter von "Thamnotrizon fallax," **59,** 1913, 83-89. **Regen, J.**—Untersuchungen ueber die stridulation von "Gryllus campestris"...., **22,** xlii, 143-44. **Washburn, F. L.**—A successful trap for cockroaches, **179,** vi, 327-29.

Azam, T.—Notes orthopterologiques, **87,** 1913, 218-222. **Borelli, A.**—Nuovo genere di Dermatteri della Republica Argentina. Di alcuni Dermatteri d. R. A., **25,** xxvii, No. 649, 660. **Caudell, A. N.**—A new pseudophylliid from Jamaica, **420,** i, 57-8. **Chopard, L.**—Contribution a la faune des O. de la Guyane Francaise (2d Mem. Gryllidae), **86,** lxxxi, 401-432. **Griffini, A.**—Intorno ad alcuni Stenopelmatidi del Museum d'Historie Naturelle di Parigl, **25,** xxvii, No. 662. **Shelford, R.**—Some new sp. of Blattidae in the Zoological Museum, Imperial Academy of Sciences, St. Petersburg, **231,** 1912, 56-60.

HEMIPTERA. **Essig, E. O.**—The Yerba Santa mealy bug (Pseudococcus yerba-santae), **189,** v, 85-88. **Lienhart, R.**—Habitat et geonemie d'Aepophilus bonnairei, **251,** 1913, 257-268. **Townsend, C. H. T.**—A brief report on the piojo blanco (Hemichionaspis minor) of cotton, **179,** vi, 318-327. **Wilson, E. B.**—A chromatoid body simulating an accessory chromosome in Pentatoma, **198,** xxiv, 392-410.

Gahan, A. B.—Some notes on the palpi of Aphidiinae, **102,** xv, 86-7. **Van der Goot, P.**—Zur systematik der Aphiden, **46,** xvi, 69-155. **Patch, E. M.**—A note on two elm leaf Aphides, **179,** vi, 316-18. A study in antennal variation, **180,** vi, 233-240. **Reuter, O. M.**—Bemerkungen ueber mein neues heteropterensystem. Hemipterologische miscellen., **298,** liv, Afd. A., No. 6, No. 7. **Smith, P. E.**—A study of some specific characters of the genus Pseudococcus, **189,** v, 69-84. **Reuter & Poppius.**—Zur kenntnis der Termatophyliden, **298,** liv, Afd. A., No. 1.

LEPIDOPTERA. Chapman, T. A.—Pupal moult of "Agriades coridon;" the maxillary pocket of Plebeiid pupae, **21,** 1913, 163-67. **Chittenden, F. H.**—The spotted beet webworm (Hymenia perspectalis), **7,** Bul. 127, 1-11. **Dyar, H. G.**—The larva of "Delias henninga." A galleriine feeding in cacao hods, **420,** i, 58-9. **Fountaine, M. E.**—Five months' butterfly collecting in Costa Rica in the summer of 1911, **9,** 1913, 189-195 (cont.). **Haseman, L.**—Unspotted tentiform leaf miner of the apple (Ornix geminatella), **179,** vi, 313-316. **Long, H. C.**—Destructive insects and pests. XI—The nun moth (Liparis monacha). (Popular ac.) **78,** 1913, 380-81. **Marsh, H. D.**—The striped beet caterpillar (Mamestra trifolii), **7,** Bul.. 127, 13-18. **Russell, H. M.**—Observations on the egg parasites of Datana integerrima, **102,** xv, 91-97. **Stauder, H.**—Beitrage zur biologie der raupen von "Lymantria dispar" und "Phalacropteryx praecellens," **92,** ix, 148-151. **Zykoff, W.**—Psychiden-studien, **92,** ix, 141-43.

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DIPTERA. **Anon.**—Report on Mosquito Control, **432,** Doc. No. 10, 37 pp. **Brain, C. K.**—Stomoxys calcitrans. Pt. 2, **180,** vi, 197-202. **Chaine, J.**—La cecidomyie du buis (Monarthropalpus buxi). Morphologie, biologie...., **251,** 1913, 269-359. **Keilin, D.**—Sur diverses glandes des larves de dipteres (note preliminaire), **73,** lii, 1-8. **Mitzmain, M. B.**—The bionomics of "Stomoxys calcitrans"; a preliminary account, **275,** viii, B, 29-48. **Pantel, J.**—Recherches sur les dipteres a larves entomobies. II. Les enveloppes de l'oeuf avec leurs dependances, les degates indirects du parasitisme, **43,** xxix, 1-289. **Shelford, V. E.**—The life-history of a bee-fly (Spogostylum anale) parasite of the larva of a tiger beetle (Cicindela scutellaris var. lecontei), **180,** vi, 213-225. **Strickland & Merriman.**—Observations on British rat fleas, **394,** vi, 1-19. **Whiting, P. W.**—Observations on the chaetolaxy of Calliphorinae, **180,** vi, 257-267. **Winslow, C. E. A.**—An insect-borne disease—infant paralysis (illustrated from models of Stomoxys and Musca), **172,** 1913, 229-235.

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Anon. (Dow, R. P.)—Rare or new C. from California, **411,** viii, 77-78. **Grouvelle, A.**—Notes sur les Silvanini. Synonymies et descriptions de genres nouveaux et de nouvelles especes. Famille des Nitidulidae. Notes synonymiques et rectifications a la nomenclature. Etude sur les Ancistria, **86,** lxxxi, 313-386, 387-400, 433-494. **Lameere, A.**—Coleopterorum catalogus. Pars 52: Cerambycidae: Prioninae, 108 pp. **Moser, I.**—Beitrag zur kenntnis der Cetoniden—XII, **35,** lvii, 155-169. **Pierce, W. D.**—Miscellaneous contributions to the knowledge of the weevils of the families Attelabidae and Brachyrhinidae, **50,** xlv, 365-426. **Sicard, A.**—Coccinellides nouveaux de la collection de M. Walter, de Ragern (Moravie), **86,** lxxxi, 507-513. **Wickham, H. F.**—Fossil C. from Florissant in the U. S. Nat. Museum, **50,** xlv, 283-303. Fossil C. from the Wilson ranch near Florissant, Colorado, **350,** vi, 1-30.

HYMENOPTERA. Crawley, W. C.—Further experiments on the temporary social parasitism in ants of the genus Lasius....., **21,** 1913, 135-138. **Girault, A. A.**—Thoughts on the H. Trichogrammatidae with corrective notes and criticisms, **119,** 1913, Ab. A, H. 1, 69-82. **Meissner, O.**—Ein merkwurdiger schmarotzer von Cimbex femorata, **166,** vii, 43-4. **Newell & Barber.**—The Argentine ant (Iridomyrmex humilis), **7,** Bul. No. 122. **Russell, A. B.**—(See under Lepidoptera.) **Schmidt, H.**—Weitere nachrichten ueber die verbreitung gallenbildender Hymenopteren in der niederschlesischen ebene, **92,** ix, 152-56.

Cockerell, T. D. A.—Descriptions and records of bees—LII, **11,** xi, 530-542. **Crawford, J. C.**—Descriptions of new H., No. 6, 7, **50,** xlv, 241-260, 309-317. **Crosby, C. R.**—A revision of the No. Am. sp. of Megastigmus, **180,** vi, 155-170. **Gahan, A. B.**—A new gen. and 1 n. sp. of Chalcidoidea, **4,** 1913, 178-182. **Girault, A. A.**—A systematic monograph of the Chalcidoid H. of the subfamily Signiphorinae, **50,** xlv, 189-233. **Lucas, R.**—H. fur 1911, **119,** 1912, Ab. B, H. 6, 443 pp. **Rohwer, S. A.**—A synopsis, and descriptions of the nearctic species of sawflies of the genus "Xyela," with descriptions of..... New parasitic H. belonging to the tribe Xoridini. Descriptions of 13 n. spp. of parasitic H. and a table to certain species of the genus "Ecphylus," **50,** xlv, 265-281, 353-61, 533-40. **Schmiedeknecht, O.**—Opuscula ichneumonologica, Fasc. xxxiv, pp. 2643-2722. Tryphoninae. **Waterhouse, C. O.**—On a n. sp. of Mymaridae from Trinidad, **313,** iv, 87-88. **Zavattari, E.**—Weitere materialien zur kenntnis der gattung "Zethus," **119,** 1913, Ab. A, H. 1, 87-118.

Distribution and Species-forming of Ecto-Parasites, By Vernon Lyman Kellogg. American Naturalist for March, 1913, Vol. XLVII, No. 555, pp. 129-158.

This paper, the last of several by the author in regard to the distribution and species-forming among the Mallophaga, is a most interesting and important one from several standpoints.

The author has divided the paper into five parts. The first is introductory. The second deals with the habits, zoological position, and life history of the Mallophaga. In the third the writer treats of the distribution of the ecto-parasites and their systematic relationships, together with some related problems. It is in the fourth, the longest and most important part of the paper, that the writer enters into the consideration of the very interesting phylogenetic problems suggested by the study of the host and geographic distribution. Part five is a short summary of conclusions. The author pays special attention to two aspects of the distribution of the biting lice. In regard to the first he states, "there is apparent in Mallophagan distribution a general faithfulness of parasite to host-kind or group of related host-kinds, and this without much reference to geographical conditions." In regard to the second aspect the writer has already written much. Here he presents in a fuller and more convincing form his law in regard to the distribution of certain parasites. He explains it as follows, "there appears a plain tendency for a single parasite species to be common to two or more related host species, even though these hosts be so widely separted geographically and so restricted to their separate geographic ranges that all possible chance of contact between individuals of the different host species seems positively precluded." This state of affairs the writer explains as follows, "the parasite species has been handed down practically unchanged to the present specifically and even generically distinct several bird species from their common ancestor of earlier days."

In regard to the general significance of this law, I can state that I have found it to hold true in regard to the distribution of certain ecto-parasitic mites, but not for all of them or for many groups. However, the parasitic Acarina constitute several distinct phylogenetic units, and their habits are very diverse. It would be of great importance to science if some one would investigate other groups of ecto-parasites in order to see if Professor Kellogg's law has a general application.—H. E. Ewing.

Bibliographia Lepidopterologica. W. Junk, Verlag und Antiquariat für Entomologie. Berlin W. 15. Sächsische Str. 68. 1913. In linen boards, 1 mark 40 pfennig, post free.—In the News for April, 1912, p. 191, we summarized the contents of Herr Junk's very useful *Bibliographia Coleopterologica*. The present catalog and price list is a similar production, including 3952 titles, preceded by a 20 page classified resumé of the most important literature on the Lepidoptera and a 6 page list of living Lepidopterological authors with their addresses. The

extent of the literature on this group of insects is such that Herr Junk estimates the cost of a working library of the most important books and periodicals at 50,000 marks, while the yearly subscriptions to important journals would amount to about 600 marks. (*Advertisement.*)

OBITUARY.

Dr. Horace Jayne.

(Portrait, Plate XII.)

Dr. Horace Jayne, at one time actively interested in the study of the Coleoptera, died at Wallingford, Pennsylvania, near Philadelphia, on Tuesday, July 8, 1913, in his fifty-fifth year.

He was a son of Dr. David Jayne and was born in Philadelphia, March 17, 1859, graduated from the College of the University of Pennsylvania in 1879 and from the Medical School of the same in 1882. After studies at the universities of Leipzig, Jena and Johns Hopkins, he returned to that of Pennsylvania, where he became assistant instructor in Biology and professor of Vertebrate Morphology, 1884-1894. He took an active part in the founding of the School of Biology, serving as secretary of the Faculty thereof, 1884-1889, Dr. Joseph Leidy being director of the school. In 1889 Dr. Jayne became Dean of the College Faculty, and in 1892 of that of the Department of Philosophy also, holding both positions until 1894. From that year until 1905 he was professor of Zoology and director of the Wistar Institute of Anatomy and Biology of the same university. In later years, until 1909, he took an active editorial interest in the *Journal of Morphology*, the *Anatomical Record* and the *Journal of Experimental Zoology*.

His zoological activities for the last thirty years of his life were mainly concerned with the mammals, and his chief work was *Mammalian Anatomy, A Preparation for Human and Comparative Anatomy. Part I. The Skeleton of the Cat, its Muscular Attachments, Growth and Variations, compared with the Skeleton of Man* (Philadelphia, J. B. Lippincott Co., 1898), a stout octavo volume of 836 pages and over 500 original illustrations. This volume was intended, to quote from the preface, as "the first of a series which aims to present a more

accurate and more comprehensive description of the structure of a typical mammal than has been hitherto attempted." No other volume appeared, however.

In a brief notice which he read on April 10, 1895, at a memorial meeting for his university colleague, John A. Ryder, Dr. Jayne refers to his own work, "in arranging part of the collections of the [American] Entomological Society" at a time when he first made Ryder's acquaintance. This must have been about 1876. He became a member of the Society August 9, 1875, in the year before that body came to occupy quarters in the building of the Academy of Natural Sciences. His association here with Drs. LeConte and Horn is indicated in the opening paragraphs of his two Coleopterological articles, *Descriptions of some monstrosities observed in North American Coleoptera* (Trans. Amer. Ent. Soc. VIII, pp. 155-162, pl. IV, June, 1880) and *Revision of the Dermestidae of the United States* (Proc. Amer. Philos. Soc. XX, pp. 343-377, pls. 1-4, August 18, 1882). The latter paper is the more pretentious, and in it the author says: "The arrangement of genera is, substantially, that already well known, save only the necessary alterations incident to the introduction of two new genera, [*Acolpus* and *Axinocerus*]. The specific classification is almost entirely original." Three new species of *Attagenus*, one of *Acolpus*, two of *Trogoderma*, one of *Axinocerus*, were described. In both of these papers the author's name appears as Horace F. Jayne, but he dropped the "F." in later years.

Dr. Jayne, in virtue of his position as secretary of the Faculty of Biology of the University of Pennsylvania, in 1888, will ever be associated in my memory with the happy beginnings of my own collegiate studies in zoology and with his willing assumption of the task of major examiner for the doctor's degree, a post made suddenly vacant by the death of Ryder. Those kindly recollections have remained unclouded, and it is with genuine sorrow that this brief notice is written in some slight acknowledgment of him who has passed away.

P. P. C.

DR. HORACE JAYNE.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

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